No. 9900359

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Cornell University - Donald H. Wallace, Cornell University - Donald E. Halseth, Cornell University - W. Larry Lyons

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED DISTINCT VARIETY OF SEXUALLY REPRODUCED, OR TUBER PROPAGATED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF TWENTY YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE ABOVE PURPOSE , OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE ABOVE PURPOSE, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. IN THE UNITED STATES SEED OF THIS VARIETY (1) MAY ONLY BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED AND (2) SHALL CONFORM TO THE NUMBER OF GENERATIONS SPECIFIED BY THE OWNER OF THE RIGHTS. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

BEAN, FIELD

'RedKanner'

In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D.C. this twenty-sixth day of July, in the year two thousand and five.

Attest:

Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Secretary of Agriculture

REPRODUCE LOCALLY. *Include form number and date on all reproductions.*

FORM APPROVED - OMB NO. 0581-0055

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY DIVISION - PLANT VARIETY PROTECTION OFFICE

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

(Instructions and information collection burden statement on reverse)

The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a) and the Paperwork Reduction Act (PRA) of 1995.

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF APPLICANT(S) *(as it is to appear on the Certificate)*

Cornell University - Donald H. Wallace
Cornell University - Donald E. Halseth
Cornell University - W. Larry Hymes

2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER

Cornell 10195

3. VARIETY NAME

RedKanner

4. ADDRESS *(Street and No., or R.F.D. No., City, State, and ZIP Code, and Country)*

New York Agricultural Experiment Station
Cornell University - Plant Breeding Dept.
Ithaca, NY 14853-1902

5. TELEPHONE *(include area code)*

607-255-2554

6. FAX *(include area code)*

607-255-9499

FOR OFFICIAL USE ONLY

PVPO NUMBER 9900359

FILING DATE: July 26, 1999

FEES RECEIVED
FILING AND EXAMINATION FEE: $ 2500
DATE: July 26, 1999
CERTIFICATION FEE: $ 432.00
DATE: 5/26/2005

7. GENUS AND SPECIES NAME

Phaseolus vulgaris

8. FAMILY NAME *(Botanical)*

Leguminosae

9. CROP KIND NAME *(Common name)*

Dry bean of the light red kidney class

10. IF THE APPLICANT NAMED IS NOT A "PERSON", GIVE FORM OF ORGANIZATION *(corporation, partnership, association, etc.) (Common name)*

11. IF INCORPORATED, GIVE STATE OF INCORPORATION

12. DATE OF INCORPORATION

13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS

~~Donald H. Wallace - Professor Emeritus~~
~~Dept. of Plant Breeding~~
~~Cornell University~~
~~Ithaca, NY 14853-1902~~

Dr. Donald E. Halseth
15 D. Plant Science Building
Dept. of Horticulture
Cornell University
Ithaca NY 14853

14. TELEPHONE *(include area code)* mail 5-5-20

607-255-~~1657~~ 5460

15. FAX *(include area code)*

~~607-255-6683~~

16. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED *(Follow instructions on reverse)*

a. [X] Exhibit A. Origin and Breeding History of the Variety
b. [X] Exhibit B. Statement of Distinctness
c. [X] Exhibit C. Objective Description of the Variety
d. [ ] Exhibit D. Additional Description of the Variety *(Optional)*
e. [X] Exhibit E. Statement of the Basis of the Applicant's Ownership
f. [X] Voucher Sample *(2,500 viable untreated seeds or, for tuber propagated varieties verification that tissue culture will be deposited and maintained in an approved public repository)*
g. [X] Filing and Examination Fee ($2,460), made payable to "Treasurer of the United States" *(Mail to PVPO)*

17. DOES THE APPLICANT SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY, AS A CLASS OF CERTIFIED SEED? *(See Section 83(a) of the Plant Variety Protection Act)*

[X] YES *(If "yes," answer items 18 and 19 below)* [ ] NO *(If "no," go to item 20)*

18. DOES THE APPLICANT SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?

[X] YES [ ] NO

19. IF "YES" TO ITEM 18, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED?

[X] FOUNDATION [ ] REGISTERED [X] CERTIFIED

20. HAS THE VARIETY OR A HYBRID PRODUCED FROM THE VARIETY BEEN RELEASED, USED, OFFERED FOR SALE, OR MARKETED IN THE U.S. OR OTHER COUNTRIES?

[X] YES *(If "yes," give names of countries and dates)* [ ] NO

Spring of 1999

21. The applicant(s) declare that a viable sample of basic seed of the variety will be furnished with application and will be replenished upon request in accordance with such regulations as may be applicable, or for a tuber propagated variety a tissue culture will be deposited in a public repository and maintained for the duration of the certificate.

The undersigned applicant(s) is(are) the owner(s) of this sexually reproduced or tuber propagated plant variety, and believe(s) that the variety is new, distinct, uniform, and stable as required in Section 42, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act.

Applicant(s) is(are) informed that false representation herein can jeopardize protection and result in penalties.

SIGNATURE OF APPLICANT *(Owner(s))*		SIGNATURE OF APPLICANT *(Owner(s))*	
Donald H. Wallace			
NAME *(Please print or type)*		NAME *(Please print or type)*	
Donald H. Wallace			
CAPACITY OR TITLE	DATE	CAPACITY OR TITLE	DATE
Professor Emeritus	July 7, 1999		

STD-470 (03-96) *(Previous editions are to be destroyed)*

(See reverse for instructions and information collection burden statement)

EXHIBIT a

Origin and breeding history of the light red kidney bean variety RedKanner

Genealogy: RedKanner was developed among progeny from a 1978 cross between the varieties Redkote and Redkloud.

The pedigree for RedKanner is:
Redkloud x Redkote.

Redkote came from a 1948 cross between Great Northern-1 (developed at the University of Idaho) with California Light Red Kidney.

Redkloud came from a 1967 cross between Redkote and Charlottown, an early yellow-eye class variety from Fredericton, New Brunswick, Canada

Breeding method: A modified recurrent selection program was used.

Selection: Starting in 1975, plants were selected each summer for highest yield, highest total above ground plant weight, and highest harvest index. Other selection criteria included acceptable light red kidney seed color, kidney seed shape and large seed size. Seeds from summer selected plants were planted, grown and intercrossed during the winter in the greenhouse. Progeny from these crosses were planted in the field each following summer for further selection. This recurrent selection process was repeated each year.

Stages of selection and multiplication: All F2 and F3 selections from each year's recurrent intercrosses were advanced by single seed descent and bulked. Selections from those F2 and F3 populations and also from advanced generation progenies were used for the continued intercrossing. The final selection was made from the F5 in 1985 and seed was increased in 1986. Replicated yield trials and canning quality comparisons began in 1987.

Redkanner has been observed to be uniform and stable. These observations have been consistent since 1985 through 2000, for 15 generations.

No variants or off types have been observed.

EXHIBIT b
Statement of distinctions for the light red kidney bean variety RedKanner

"Redkanner" is similar to California Early Light Red Kidney (CELRK) in seed color, shape, and determinate plant habit. It differs in the following characteristics.

Blossom color: Redkanner differs from CELRK in blossom color (white for Redkanner, light lavender for CELRK).

Canning Quality: Redkanner has surpassed CELRK in canning quality tests (Table 1). This is the prime reason for the release of this variety.

Seed yields: Redkanner had higher seed yields than CELRK in 43 of 54 location years (1996, 97, 98) in the regional and national Cooperative Dry Bean Nursery Yield Trials (Table 2). RedKanner's average yields for 18 trials in each of 1996, 1997 and 1998 were 24, 15 and 26% higher than the average yields of CELRK.

Seeds per pound: Redkanner had higher numbers of seed per pound (smaller seed size) than CELRK in all 40 trials in which seeds per pound were compared (Table 3).

Plant height: Redkanner had consistently greater plant height than CELRK, ranging from 1.1 to 5.4 inches taller than CELRK in the 6 location years that height was measured (Table 4)

Days to flowering: Redkanner averaged 6 days later than CELRK in days later in days to flowering, over 47 location years in 1996, 1997 and 1998 (Table 5)

Days to physiological maturity: Redkanner averaged 10 days later in days to physiological maturity than CELRK over 32 location years (Table 5).

Statistical Analysis: All data presented were analyzed using a t test. Additionally the yield data were also analyzed using ANOVA followed by AMMI analysis.

Table 1: Comparisons of ratings of RedKanner with named red kidney varieties for canned bean quality. based on size, color and appearance of the canned beans. Appearance depends mostly on lack of seedcoat cracks.

Years	Number		Canned Product Quality		
tested	of trials	Variety	Size	Color	Appearance
96-00	16	Chinook 200	1.97	1.80	0.81
96-00	16	RedKanner	1.94	1.77	1.20
94-00	28	Chardonay	1.99	1.67	1.09
94-00	28	RedKanner	2.93	1.83	1.29
88, 90-94	16	Redkloud	1.75	0.81	0.25
88, 90-94	24*	RedKanner	1.95	1.76	0.93
90-92	4	Sacramento Red Kid	2.00	1.87	0.50
90-92	4	RedKanner	1.83	1.33	0.67
90-91	6	Isabella	1.50	1.67	0.00
90-91	6	RedKanner	1.75	1.33	0.50
88, 90-96	27	California LRK	1.85	1.00	-0.15
88, 90-96	27	RedKanner	1.93	1.50	1.08
90-96	56	Horizon	1.95	1.83	0.72
90-96	57*	RedKanner	1.96	1.82	1.50
90-00	118	California ELRK	1.91	1.92	1.01
90-00	118	RedKanner	1.95	1.81	1.39

*In some years RedKanner was compared in more replications than the other variety. Ratings were base on 0 to 2 scale, with 2 as superior, I satisfactory, and 0 unsatisfactory. The rater often added one or less often two or three asterisks after rates of 1 that, respectively, were were interpreted as 1.25, 1.50 and 1.75.

The data are fron New York State Trials of 1988-2000.

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Table 2. Comparison of RedKanner and California Light Red Kidney for yields during 1996, 1997 and 1998 in the Cooperative Dry Bean Nursery yield trials.

	Yield lb/A					
	1996		1997		1998	
Location	*RedKanner*	*CELRK*	*RedKanner*	*CELRK*	*RedKanner*	*CELRK*
Freeville NY	2652	3134*	--	--	3273	2587
Lansing MI	3500	2640	--	--	--	--
Elora ON	2084	1833	2333	1941	2443	1734
Saginaw MI	--	--	3120	1860	2340	2190
NorthEast mean	2745	2536	2727	1901	2685	2170
Clarkton MO	--	--	176	94	--	--
Columbia MO	1478	1074	866	685	--	--
Scottsbluff NE	3568	2958	2160	1715	2720	2060
FtCollins CO	--	--	1313	1197	1789	1251
Central area mean	2523	2016	1446	1199	2255	1656
Brooks Alberta	--	--	3095	1805	2438	826
Outlook Saskatoon	707	--	--	--	--	--
Lethbridge Alberta	--	--	2402	2227	--	--
Saskatoon Saskatoon	1005	753	245	629*	390	774
Vauxhall Alberta	753	1066	--	--	--	--
Sidney MT	3790	2550	2450	3120*	--	--
Powell WY	2404	2461*	518	444	2825	1871
Bow Island Alberta	1301	997	--	--	--	--
Erie ND	2686	1967	2852	2090	2479	1569
Torrington WY	3087	2000	1492	1165	1824	1317
Penham MN	--	--	--	--	1539	529
Morden MA	--	--	--	--	1448	1021
North Great Plain	1967	1685	1865	1640	1849	1130
Lubbock TX	617	340	64	178*	--	--
Othello WA	2804	2477	2471	2788*	1367	1713*
Fruitia CO	1360	1261	2006	1723	2150	1578
Kimberly ID	1919	1407	1781	1638	1515	1452
Parma ID	2196	1468	--	--	1328	2005*
NorthWestern mean	2070	1653	2086	2050	1590	1687
Farmington NM	2320	3190*	--	--	1830	1940*
Safford AZ	--	--	2817	2648	--	--
Bonita AZ	--	--	--	--	2454	2266
SouthWestern mean	2320	3190	2817	2648	2142	2103
Grand Mean	**2072**	**1669**	**1949**	**1692**	**2008**	**1594**
LSD for varieties by year		89		48		32
LSD for locations by year		162		62		38

LSDs are from ANOVA and AMMI analysis of all compared kidney varieties

t test at 0.05 indicates RedKanner yielded significantly more than CELRK with P = 0.0168

Yield advantage by regional geographic area and by year of RedKanner over CELRK

	1996	1997	1998
NorthEast area	1.08	1.43	1.24
Central area	1.25	1.21	1.36
Nirth Great Plain	1.17	1.14	1.64
Northwestern area	1.25	1.02	0.94
Southwestern area	1.24	1.15	1.26
Grand Advantage	1.24	1.15	1.26

Table 3. Comparison of RedKanner and California Light Red Kidney for number of seed per pound in **the 1996, 1997 and 1998 Cooperative Dry Bean Nursey yield trials.**

	No. Seed/lb.					
	1996		1997		1998	
Location	*RedKanner*	*CELRK*	*RedKanner*	*CELRK*	*RedKanner*	*CELRK*
Freeville NY	833	703	--	--	846	783
Lansing MI	801	732	--	--	--	--
Elora ON	819	706	686	650	--	--
Saginaw MI	--	--	721	697	906	707
NE mean	818	714	703	674	876	745
Scottsbluff NE	1037	769	970	848	1080	810
FtCollins CO	--	--	942	765	940	794
CENTRAL mean	1037	769	956	807	1010	802
Brooks AB	--	--	474	369	1080	978
Powell WY	1002	834	965	812	986	794
Lethbridge AB	--	--	1056	841	--	--
Outlook SK	1167	--	--	--	--	--
Erie ND	1113	697	876	835	812	836
Torrington WY	990	770	913	828	1074	794
Vauxhall AB	1508	894	--	--	--	--
Bow Island AB	1010	805	--	--	--	--
Perham ND	--	--	--	--	763	758
NGP mean	1132	800	857	737	930	834
Othello WA	1051	901	1103	862	1144	1026
Fruitia CO	1198	1001	995	847	1019	1028
Kimberly ID	990	875	1045	816	1245	932
Parma ID	1063	928	--	--	900	875
NW mean	1075	926	1048	842	1077	965
Safford AZ	--	--	865	678	--	--
Bonita AZ	--	--	--	--	1040	815
SW mean			865	678	1040	815
Grand Mean	**1041**	**758**	**893**	**758**	**973**	**838**
t test at 0.05 level indicates RedKanner has significantly smaller seed with p=0.0001						
Additional number of seeds needed for one pound	**293**		**125**		**135**	
Percent more seeds needed	37%		16%		16%	

Table 4. Comparison of RedKanner and California Early Light Red Kidney for plant height in the 1996, 1997 and 1998 Cooperative Dry Bean Nursery yield trials.

	Plant Height inches			
Location	*1997*		*1998*	
	RedKan	CELRK	RedKan	CELRK
Freeville NY[1]	--	--	--	--
Lansing MI[2]	--	--	--	--
Saginaw MI	--	--	17.9	16.4
Brooks AL[4]	--	--	--	--
Lethbridge AL[3]	--	--	--	--
Columbia MO[3]	10	5	--	--
Vauxhall AB[3]	--	--	--	--
Bow Isl. AB[3]	--	--	--	--
Erie ND	21.5	18.7	19.1	13.7
Othello WA[3]	13.8	12.7	--	--
Morden MA	--	--	21.1	17.2
Kimberly ID[3]	--	--	--	--
Parma ID[3]	--	--	--	--
Bonita AZ	--	--	--	--
Safford AZ	--	--	--	--
GRAND MEAN	15.1	12.1	19.4	15.8
AVE. DIFFERENCE		-2.1		-3.6
RANGES	10to22	5to19	18to21	14to17

Observed heights by year/location range from 29 to 84 cm for RedKanner versus 20 to 71 for CELRK

t test at 0.05 did not indicate a significant difference in height, the p being 0.25

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Table 5. Comparison of RedKanner and California Early Light Red Kidney for days to flowering and to maturity in the 1996, 1997 and 1998 Cooperative Dry Bean Nursery yield trials.

Days to 50 percent of all plants flowering

	1996		1997		1998	
Location	*RedKanner*	*CELRK*	*RedKanner*	*CELRK*	*RedKanner*	*CELRK*
Freeville NY	47	42				
Lansing MI	42	39				
Elora ON	47	43	48	42	42	35
Saginaw MI			40	37	41	36
NorthEast area mean	45	41	44	40	42	36
Columbia MO						
Scottsbluff NE	41	36	37	36	47	43
Central USA mean	41	36	37	36	47	43
Brooks AB						
Lethbridge AB			59	62		
Saskatoon SK	50	47	44	40	56	45
Powell WY	58	50	45	51		
NorthUSA into Canada	54	49	51	51	56	45
Bow Island AB	53	47	64	46		
Erie ND						
Morden MA					54	48
Torrington WY	50	50				
North GreatPlain mean	51.5	48.5	64	46	54	48
Othello WA	62	56	51	43	39	34
Kimberly ID	45	42	45	43	48	43
Parma ID	49	45			52	47
NorthWestern mean	52	48	48	43	46	41
Grand Mean	**49**	**44**	**49**	**43**	**49**	**43**
Overall Range	**41 to 58**	**36 to 56**	**37 to 64**	**36 to 62**	**39 to 56**	**34 to 48**

t test at 0.05 level indicates RedKanner flowers significantly later than CELRK with P = 0.0136

Days to Physiological Maturity

	1996		1997		1998	
Location	*RedKanner*	*CELRK*	*RedKanner*	*CELRK*	*RedKanner*	*CELRK*
Freeville NY	99	90	--	--	--	--
Lansing MI	98	91	--	--	--	--
Elora ON	110	102	110	102	102	94
Saginaw MI	--	--	111	102	96	92
NorthEast mean	102	94	110	102	99	93
Columbia MO	98	94	--	--	--	--
Scottsbluff NE	103	85	93	71	--	--
Central mean	101	90	93	71		
Brooks AB	--	--	119	103	125	116
Lethbridge AB	--	--	108	108	--	--
Saskatoon SK	99	96	90	76	--	--
Powell WY	107	100	--	--	--	--
NorthUSA into Canada	103	98	109	100	125	116
Bow Island AB	117	106	--	--	--	--
Erie ND	107	104	107	97	110	86
Morden MA	--	--	--	--	118	102
Torrington WY	92	87	101	99	101	99
NorthGreatPlains mean	104	99	105	97	114	101
Othello WA	96	92	90	85	87	77
Kimberly ID	96	91	93	87	94	88
Parma ID	104	102	--	--	113	104
NorthWest mean	99	95	92	86	98	90
Grand Mean	**102**	**95**	**102**	**91**	**109**	**100**
Overall Range	**92 to 117**	**85 to 106**	**90 to 119**	**71 to 108**	**87 to 125**	**77 to 116**

t test at 0.05 level indicates RedKanner maturity is significantly later than CELRK with P = 0.011

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U. S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

Exhibit C

OBJECTIVE DESCRIPTION OF VARIETY
Dry Edible Bean (Phaseolus vulgaris L.)

NAME OF APPLICANT(S)	EXPERIMENTAL NAME	VARIETY NAME
Cornell University - Donald H. Wallace	Cornell 1095	RedKanner

ADDRESS (Street and No. or R.F.D. No., City, State, ZIP)
Plant Breeding Department
Cornell University
Ithaca, NY 14853-1902

FOR OFFICIAL USE ONLY

PVPO NO. 9900359

Provide data for all characters unless indicated as "optional." Place numbers in the boxes for the characters or numerical values which best describe this variety. Measured data should be the mean of an appropriate number of well spaced (15-20 cm) plants. The Royal Horticulture Society or any recognized color standard may be used to determine plant color. Designate the color system used below.

COLOR SYSTEM USED

LOCATION OF THE TEST(S) TO EVALUATE THIS VARIETY

1. MARKET CLASS

[1][0]

CLASS	CHECK
1 = Navy (Pea)	Seafarer
2 = Small White	Aurora
3 = Black	Midnight
4 = Pinto	UI-114
5 = Great Northern	UI-59
6 = Small Red	NW-59
7 = Pink	Viva
8 = Cranberry	UI-50
9 = Dark Red Kidney	Montcalm
10 = Light Red Kidney	Redkloud
11 = Yellow Eye	Steuben
12 = Other (specify)	

California Early Light Red Kidney

2. MATURITY

[3] 1 = Early (80-90 days); 2 = Medium (90-100 days); 3 = Late (>100 days)

[1][0][5] Days from planting to harvest maturity

[ ][ ][ ][ ] Heat units from planting to harvest maturity (optional). Specify base temperature used: _____

[ ][8][5] Days from planting to harvest maturity of check variety (use check appropriate to market class shown in item 1)

↳ for both Redkloud and California Early Light Red Kidney

3. PLANT HABIT

[4]

TYPE
1 = Ia Bush-determinate, strong and erect stem and branches
2 = Ib Bush-determinate, weak stem and branches
3 = IIa Erect growth habit-indeterminate, guides (runners) short or not developed
4 = IIb Erect growth habit-indeterminate, guides medium to long, with no ability to climb
5 = IIIa Vine-indeterminate, short guides with no ability to climb
6 = IIIb Vine-indeterminate, long guides with ability to climb
7 = IVa Indeterminate climbing, pods distributed throughout the plant
8 = IVb Indeterminate climbing, pods concentrated on the upper part of the plant

[ ][4][5] Average height of mature plant, in cm.

[ ][3][7] Average height of check variety, in cm. (use same check as above)

[3] Pod Position: 1 = Low (lower pods touching soil surface) 2 = High (lower pods not touching soil surface) 3 = Scattered (not concentrated high or low)

[ ] Adaptability to machine harvest: 1 = Adapted 2 = Not Adapted

[2] Lodging resistance: 1 = Good 2 = Fair 3 = Poor

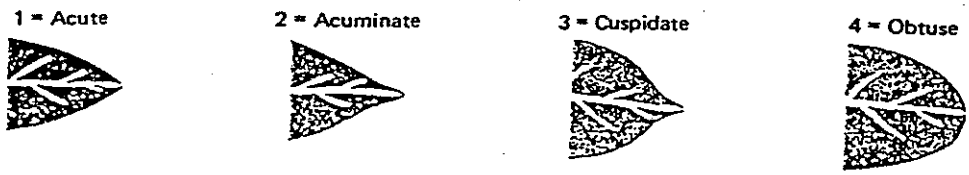
LEAFLET MORPHOLOGY (Use terminal leaflet of a fully expanded trifoliolate)

[1] 1 = Smooth; 2 = Wrinkled

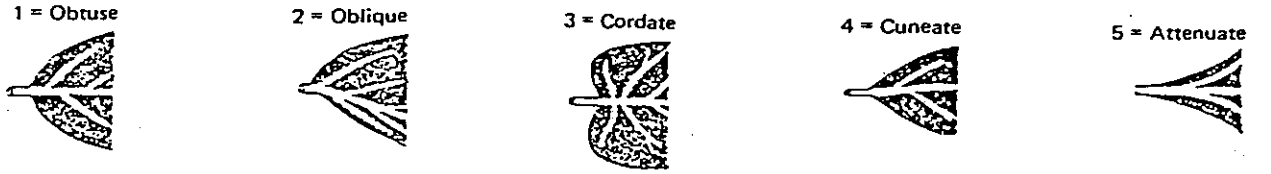
[3] 1 = Dull; 2 = Glossy; 3 = Semiglossy; 4 = Variable

[1] SHAPE:

[2] APEX OF LEAFLET:



[1] BASE OF LEAFLET:



5. FLOWER COLOR AND DAYS TO BLOOM

[4] COLOR OF STANDARD: 1 = White; 2 = Cream; 3 = Pink; 4 = Blue; 5 = Purple

[4] COLOR OF KEEL: 1 = White; 2 = Cream; 3 = Pink; 4 = Blue; 5 = Purple

[4] COLOR OF WINGS: 1 = White; 2 = Cream; 3 = Pink; 4 = Blue; 5 = Purple

[4][5] Days to 50% bloom

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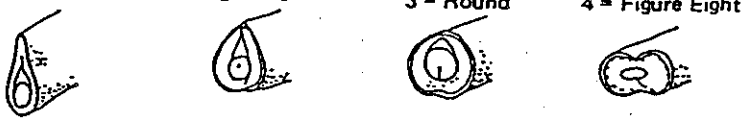
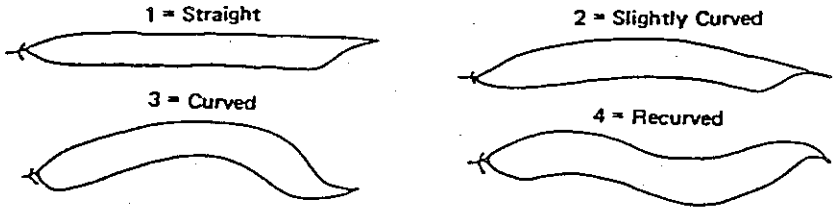
6. POD MORPHOLOGY (Green pod morphology optional)

Green	Mature		
[1]	[1]	COLOR PATTERN:	1 = Solid; 2 = Striped; 3 = Blotched; 4 = Mottled; 5 = Other _____
[3]	[5]	PRIMARY COLOR:	1 = Purple; 2 = Red; 3 = Green; 4 = Yellow; 5 = Tan; 6 = Brown; 7 = Other _____
[ ]	[ ]	COLOR MODIFIER:	1 = Light; 2 = Light Medium; 3 = Medium; 4 = Medium Dark; 5 = Dark
[ ]	[ ]	SECONDARY COLOR:	1 = Purple; 2 = Red; 3 = Green; 4 = Yellow; 5 = Tan; 6 = Brown; 7 = Other _____

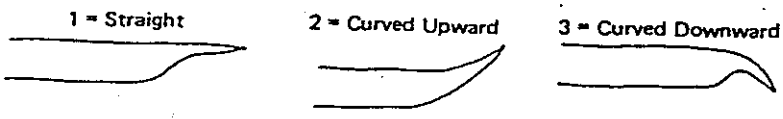
[3] [2] CROSS SECTION SHAPE: 1 = Flat; 2 = Pear; 3 = Round; 4 = Figure Eight



[ ] [1] POD CURVATURE: 1 = Straight; 2 = Slightly Curved; 3 = Curved; 4 = Recurved



[1] [ ] POD BEAK ORIENTATION: 1 = Straight; 2 = Curved Upward; 3 = Curved Downward; 4 = Variable



Average beak length, in cm. _____

[1] [2] CONSTRICTIONS: 1 = None; 2 = Slight; 3 = Deep

[7] . [5-6] Average number of seeds per pod

→ Some pods have 8 seeds

7. SEED COLOR

[3] 1 = Shiny; 2 = Dull; 3 = Semishiny; 4 = Variable

[1] 1 = Monochrome; 2 = Polychrome

[ ][7] PRIMARY COLOR: 1 = White; 2 = Yellow; 3 = Buff; 4 = Tan; 5 = Brown; 6 = Pink; 7 = Red; 8 = Purple; 9 = Blue; 10 = Black; 11 = Other _____

[ ][ ] SECONDARY COLOR: 1 = White; 2 = Yellow; 3 = Buff; 4 = Tan; 5 = Brown; 6 = Pink; 7 = Red; 8 = Purple; 9 = Blue; 10 = Black; 11 = Other _____

[1] COLOR PATTERN: 1 = Solid; 2 = Splashed; 3 = Mottled; 4 = Striped; 5 = Flecked; 6 = Dotted

[ ] HILAR RING: 1 = Absent; 2 = Present

[ ][7] HILAR RING COLOR: 1 = White; 2 = Yellow; 3 = Buff; 4 = Tan; 5 = Brown; 6 = Pink; 7 = Red; 8 = Purple; 9 = Blue; 10 = Black; 11 = Other _____

8. SEED SHAPE AND WEIGHT

[4] SHAPE OF SEED TAKEN FROM MIDDLE OF POD: 1 = Round; 2 = Oval; 3 = Cuboid; 4 = Kidney; 5 = Truncate Fastigiate

[5][4] Dry seed weight in g/100 seeds (adjusted to 12% moisture)

9. ANTHOCYANIN PIGMENTATION

1 = ABSENT
2 = PRESENT

[1]	Flowers	[1]	Stems	[1]	Pods	[2]	Seeds
[1]	Leaves	[1]	Petioles	[1]	Peduncles	[1]	Nodes

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10. KNOWN DISEASE REACTION

DISEASES - COMMON NAME: Anthracnose, Rust, Powdery mildew, Fusarium root rot, Pythium root rot, Rhizoctonia root rot, Pythium wilt, Sclerotinia white mold, Angular leaf spot, Bacterial wilt, Halo blight, Fuscous blight, Common bacterial blight, Red node virus, Pod mottle virus, Bean common mosaic virus, Bean yellow mosaic virus, Curly top virus, Bacterial brown spot, Bean southern mosaic virus, Other (specify) _____

REACTION: 1 = Susceptible; 2 = Resistant; 3 = Tolerant; 4 = Avoidance

(Give the common name (CN), scientific name (SN), and race(s), where applicable)

- [ ] DISEASE: CN Bean common mosaic Virus SN _____ ; Race(s) Michigan data: Test against NL3 strain indicate it carries the unprotected I gene
- [ ] DISEASE: CN anthracnose ; SN Colletotrichum lindemuthianum ; Race(s) Michigan data: Susceptible to races 7 and 73
- [ ] DISEASE: CN halo blight ; SN Pseudomonas phasalei ; Race(s) Parents Redkloud and Redkote were both Resistant No tests on Redkanner
- [ ] DISEASE: CN Common blight ; SN Xanthomonas campestris ; Race(s) Nebraska data: Among the most resistant light red kidney beans
- [ ] DISEASE: CN rust ; SN _____ ; Race(s) Nebraska data from Biological and Cultural tests Resistant for control of Plant Diseases 1978
- [ ] DISEASE: CN _____ ; SN _____ ; Race(s) _____

11. KNOWN INSECT/NAMATODE RESISTANCE

PESTS - COMMON NAME: Aphids, Bean pod weevil, Bruchid beetle, Corn earworm, Flea beetle, Leaf hopper, Lesion nematode, Lygus, Mexican bean beetle, Root knot nematode, Corn seed maggot, Spider mites, Thrips, Weevils, Western bean cutworm, Other (specify)

_____

REACTION: 1 = Susceptible; 2 = Resistant; 3 = Tolerant; 4 = Avoidance

(Give the common name (CN), scientific name (SN), and biotype, where applicable)

- [ ] PEST: CN _____ ; SN _____ ; Biotype _____
- [ ] PEST: CN _____ ; SN _____ ; Biotype _____
- [ ] PEST: CN _____ ; SN _____ ; Biotype _____

12. KNOWN PHYSIOLOGICAL STRESS REACTION

1 = Susceptible; 2 = Resistant; 3 = Tolerant; 4 = Avoidance

[ ] Heat [ ] Cold [ ] Drought [ ] Air Pollution

Nutrient toxicity or deficiency (specify nutrient) _____

Other Days To flower is sensitive to photoperiod and temperature due to gene Ppd. Long days and/or high temperature Delay flowering and increase vegetative growth, i.e. Total plant weight

13. COMMENTS

EXHIBIT ¢ D
Objective description of the light red kidney bean variety RedKanner

Morphological, physiological and other characteristics

The stems and branches of RedKanner have ranged by location year from 40 to 80 cm height and are moderately upright. The plant habit is determinate The main stem and all branches are terminated with a reproductive inflorescence or with a partially to completely aborted inflorescence. The flowers are white. The main stems of RedKanner have 6 to 8 nodes. Redkanner pods commonly contain eight seeds, or eight ovules for a potential of eight seeds. RedKanner has late flowering, late maturity, many branches and a low harvest index.

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U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

EXHIBIT E
STATEMENT OF THE BASIS OF OWNERSHIP

The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a) and the Paperwork Reduction Act (PRA) of 1995.

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF APPLICANT(S)

Cornell University - Donald H. Wallace
Cornell University - Donald E. Halseth
Cornell University - W. Larry Hymes

2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER

10195

3. VARIETY NAME

RedKanner

4. ADDRESS *(Street and No., or R.F.D. No., City, State, and ZIP, and Country)*

New York Agricultural Experiment Station
Cornell University - Plant Breeding Dept.

5. TELEPHONE *(include area code)*

607-255-2554

6. FAX *(include area code)*

607-255-9499

7. PVPO NUMBER

9900359

8. Does the applicant own all rights to the variety? *Mark an "X" in appropriate block.* **If no, please explain.** [X] YES [ ] NO

9. Is the applicant (individual or company) a U.S. national or U.S. based company? [X] YES [ ] NO
If no, give name of country

10. Is the applicant the original owner? [X] YES [ ] NO ***If no, please answer one of the following:***

a. If original rights to variety were owned by individual(s), is (are) the original owner(s) a U.S. national(s)?

[ ] YES [ ] NO **If no, give name of country**

b. If original rights to variety were owned by a company(ies), is(are) the original owner(s) a U.S. based company?

[ ] YES [ ] NO **If no, give name of country**

11. Additional explanation on ownership *(if needed, use reverse for extra space)*:

PLEASE NOTE:

Plant variety protection can be afforded only to owners (not licensees) who meet one of the following criteria:

1. If the rights to the variety are owned by the original breeder, that person must be a U.S. national, national of a UPOV member country, or national of a country which affords similar protection to nationals of the U.S. for the same genus and species.

2. If the rights to the variety are owned by the company which employed the original breeder(s), the company must be U.S. based, owned by nationals of a UPOV member country, or owned by nationals of a country which affords similar protection to nationals of the U.S. for the same genus and species.

3. If the applicant is an owner who is not the original owner, both the original owner and the applicant must meet one of the above criteria.

The original breeder/owner may be the individual or company who directed final breeding. See Section 41(a)(2) of the Plant Variety Protection Act for definition.

STD-470-E (07-97) *(Destroy previous editions).*
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